APPENDIX A

PLAN OF DEP REGIONAL OFFICES

AND

LIST OF COMMUNITIES

Massachusetts Department of Environmental Protection

Addresses and Phone Numbers

DEP Boston
One Winter Street
Boston, MA 02108
Telephone: (617) 292-5500
Fax: (617) 556-1049
TDD: (617) 574-6868

William X. Wall Experiment Station
37 Shattuck Street
Lawrence, MA 01843
Fax: (978) 688-0352
Division of Environmental Analysis
Telephone: (978) 682-5237
Air Quality Surveillance
Telephone: (978) 975-1138

Office of Watershed Management
627 Main Street
Worcester, MA 01608
Telephone: (508) 792-7470
Fax: (508) 839-3469

Millbury Training Center
Route 20 Millbury, MA 01527
Telephone: (508) 368-5600
Fax: (508) 755-9253
Residuals Sludge Management
Telephone: (508) 368-5606
WWT Operator Certification
Telephone: (508) 368-5698

DEP Western Region
436 Dwight Street
Suite 402
Springfield, MA 01103
Phone: (413) 784-1100
Fax: (413) 784-1149

Adams
Agawam
Alford
Amherst
Ashfield
Becket
Belchertown
Bernardston
Blandford
Brimfield
Buckland
Charlemont
Cheshire
Chester
Chesterfield
Chicopee
Clarksburg
Colrain
Conway
Cummington
Dalton
Deerfield
Easthampton
East Longmeadow
Egremont
Erving
Florida
Gill
Goshen
Granby
Granville
Great Barrington
Greenfield
Hadley
Hampden
Hancock
Hatfield
Hawley
Heath
Hinsdale
Holland
Holyoke
Huntington
Lanesborough
Lee
Lenox
Leverett
Leyden
Longmeadow
Ludlow
Middlefield
Monroe
Montague
Monterey
Montgomery
Monson
Mount Washington
New Ashford
New Marlborough
New Salem
North Adams
Northampton
Northfield
Orange
Otis
Palmer
Pelham
Peru
Pittsfield
Plainfield
Richmond
Rowe
Russell
Sandisfield
Savoy
Sheffield
Shelburne
Shutesbury
Southampton
South Hadley
Southwick
Springfield
Stockbridge
Sunderland
Tolland
Tyringham
Wales
Ware
Warwick
Washington
Wendell
Westfield
Westhampton
West Springfield
West Stockbridge
Whately
Wilbraham
Williamsburg
Williamstown
Windsor
Worthington

DEP Central Region
627 Main Street
Worcester, MA 01608
Phone: (508) 792-7650
Fax: (508) 792-7621
TDD: (508) 767-2788

Acton
Ashburnham
Ashby
Athol
Auburn
Ayer
Barre
Bellingham
Berlin
Blackstone
Bolton
Boxborough
Boylston
Brookfield
Charlton
Clinton
Douglas
Dudley
Dunstable
East Brookfield
Fitchburg
Gardner
Grafton
Groton
Harvard
Hardwick
Holden
Hopedale
Hopkinton
Hubbardston
Hudson
Holliston
Lancaster
Leicester
Leominster
Littleton
Lunenburg
Marlborough
Maynard
Medway
Mendon
Milford
Millbury
Millville
New Braintree
Northborough
Northbridge
North Brookfield
Oakham
Oxford
Paxton
Pepperell
Petersham
Phillipston
Princeton
Royalston
Rutland
Shirley
Shrewsbury
Southborough
Southbridge
Spencer
Sterling
Stow
Sturbridge
Sutton
Templeton
Townsend
Tyngsborough
Upton
Uxbridge
Warren
Webster
Westborough
West Boylston
West Brookfield
Westford
Westminster
Winchendon
Worcester

DEP Southeast Region
20 Riverside Drive
Lakeville, MA 02347
Phone: (508) 946-2700
Fax: (508) 947-6557
TDD: (508) 946-2795

Abington
Acushnet
Attleboro
Avon
Barnstable
Berkley
Bourne
Brewster
Bridgewater
Brockton
Carver
Chatham
Chilmark
Dartmouth
Dennis
Dighton
Duxbury
Eastham
East Bridgewater
Easton
Edgartown
Fairhaven
Fall River
Falmouth
Foxborough
Franklin
Freetown
Gay Head
Gosnold
Halifax
Hanover
Hanson
Harwich
Kingston
Lakeville
Mansfield
Marion
Marshfield
Mashpee
Mattapoisett
Middleborough
Nantucket
New Bedford
North Attleborough
Norton
Norwell
Oak Bluffs
Orleans
Pembroke
Plainville
Plymouth
Plympton
Provincetown
Raynham
Rehoboth
Rochester
Rockland
Sandwich
Scituate
Seekonk
Sharon
Somerset
Stoughton
Swansea
Taunton
Tisbury
Truro
Wareham
Wellfleet
West Bridgewater
Westport
West Tisbury
Whitman
Wrentham
Yarmouth

DEP Northeast Region
One Winter Street
Boston, MA 02108
Telephone: (617) 654-6500
Fax: (617) 556-1049
TDD: (617) 574-6868

Amesbury
Andover
Arlington
Ashland
Bedford
Belmont
Beverly
Billerica
Boston
Boxford
Braintree
Brookline
Burlington
Cambridge
Canton
Carlisle
Chelmsford
Chelsea
Cohasset
Concord
Danvers
Dedham
Dover
Dracut
Essex
Everett
Framingham
Georgetown
Gloucester
Groveland
Hamilton
Haverhill
Hingham
Holbrook
Hull
Ipswich
Lawrence
Lexington
Lincoln
Lowell
Lynn
Lynnfield
Malden
Manchester-By-The-Sea
Marblehead
Medfield
Medford
Melrose
Merrimac
Methuen
Middleton
Millis
Milton
Nahant
Natick
Needham
Newbury
Newburyport
Newton
Norfolk
North Andover
North Reading
Norwood
Peabody
Quincy
Randolph
Reading
Revere
Rockport
Rowley
Salem
Salisbury
Saugus
Sherborn
Somerville
Stoneham
Sudbury
Swampscott
Tewksbury
Topsfield
Wakefield
Walpole
Waltham
Watertown
Wayland
Wellesley
Wenham
West Newbury
Weston
Westwood
Weymouth
Wilmington
Winchester
Winthrop
Woburn

APPENDIX B

SCHEDULE OF PERMIT END DATES

WATERSHED	END OF PERMIT DATE
Hudson River	February 28, 2009
Blackstone	August 31, 2009
Charles	August 31, 2009
Ipswich	February 28, 2010
North Coastal	February 28, 2010
Boston Harbor	August 31, 2010
Taunton	August 31, 2010
South Coastal	February 28, 2011
Cape Cod	May 31, 2011
Islands	August 31, 2011
Buzzards Bay	November 30, 2011
Concord	February 28, 2012
Ten Mile	May 31, 2012
Deerfield	August 31, 2012
Housatonic	November 30, 2012
Farmington	February 28, 2013
Westfield	May 31, 2013
Millers	August 31, 2013
Chicopee	November 30, 2013
Quinnebaug	February 28, 2014
Connecticut	May 31, 2014
Nashua	August 31, 2014
French	November 30, 2014
Shawsheen	February 28, 1015
Merrimack	May 31, 2015
Parker	August 31, 2015
Narragansett	November 30, 2015

APPENDIX C

WMA PROGRAM PERMIT

PROCESSING TIME LINE

APPENDIX D

WMAP POLICY

FOR

PERMITS, 5 YEAR REVIEWS

AND

AMENDMENTS

WATER MANAGEMENT POLICY
FOR PERMIT AND PERMIT AMENDMENT APPLICATIONS AND 5-YEAR REVIEWS

Effective Date: April 5, 2004 WMA Policy #: BRP/DWM/DW/P04-1

Program Applicability: Water Management Act Program (310 CMR 36.00)

Approved by: Cynthia Giles, Assistant Commissioner, Bureau of Resource Protection

SUMMARY

The Department adopts this Policy to protect the waters of the Commonwealth and to better achieve the goal of balancing competing water uses. In considering all Water Management Act permitting decisions, including permit and permit amendment applications, 5-year compliance reviews of existing permits, and other permit modifications, DEP will:

- Impose water conservation and reporting standards.
- Use site screening criteria to identify where new sources or increases from existing sources would likely have significant flow impacts and therefore require a more rigorous review including an evaluation of need and alternatives to any increase in volume.
- Require that proposals for new or increased withdrawals include evaluation of ways to offset proposed withdrawals by reducing out of basin flow or increasing water returned to the basin.
- Deny requests for new or increased withdrawals that cannot be mitigated and will cause a significant impact.

BASIS FOR THE POLICY

The guiding principles for this Policy are the goals set out in the Water Management Act, including the directive to ensure a balance among competing water withdrawals and uses and the statutory factors DEP is required to consider.[1] This policy: 1) requires more protection of our stressed water resources through implementation of conservation standards and other measures affecting nonessential water uses, 2) prevents conditions from getting worse by using higher standards to evaluate all proposed increases in water use, and 3) requires increased withdrawals to evaluate the feasibility of mitigating impacts through offsets in water management elsewhere and implement those that are feasible, commensurate with the degree of stress in the basin and impact of the withdrawal.

[1] See Chapter 21G, sections 3 and 7.

For purposes of this Policy, the Department adopts the stressed basin determinations contained in the WRC Report, *Stressed Basins in Massachusetts* (approved December 13, 2001). The Report evaluated hydrologic stress on flow, and developed a classification of high, medium, and low stressed basins or those defined as unassessed.

SAFE YIELD

The principal basis for controlling permitted water withdrawals under the Water Management Act is the concept of safe yield. Safe yield is the volume of water that can be removed from surface or groundwater without unreasonable damage to the water resource.

Implicit in the statutory definition of safe yield is the recognition that surface water and groundwater are one hydrologic unit, and that groundwater withdrawals have the potential to impact the natural function of storage/groundwater discharge to a stream as base flow during the low flow period. The statutory definition further recognizes drought as a probability, which incorporates the complexity of natural variability of streamflow as measured in magnitude, frequency, duration, timing and rate of change, upon which safe yield withdrawals are to be based. DEP is therefore proposing regulations to replace the regulatory definition of safe yield with the statutory definition, so that the statutory purpose is better achieved and the regulations better aligned with available science and the stated purpose of the statute.

For purposes of this Policy, the definition of safe yield shall be the statutory definition:

"Safe yield", the maximum dependable withdrawals that can be made continuously from a water source including ground or surface water during a period of years in which the probable driest period or period of greatest water deficiency is likely to occur; provided, however, that such dependability is relative and is a function of storage and drought probability. [2]

STANDARDS AND CONDITIONS

The following standards and conditions will be included as appropriate in all permitting decisions, including the issuance of new permits, permit amendments, 5 Year Reviews of existing permits, or other permit modifications. (See the Department's Guidance on this Policy for more details on implementation.)

[2] MGL, Chapter 21G, Section 2, Definitions

- Cap on per capita per day residential water use (no more than 65 gallons per capita for high and medium stress basins, no more than 80 gallons per capita for low stress and unassessed basins).
- Limits on unaccounted for water (no more than 10% for high and medium stress basins, no more than 15% for low stress and unassessed basins).
- Summer limits on withdrawals (limit varies based on prior use).
- Streamflow thresholds that trigger mandatory limits on nonessential outdoor water use, including but not limited to lawn and landscape irrigation.
- Standard and consistent reporting requirements.
- Streamflow monitoring.

REVIEW OF PERMIT OR PERMIT AMENDMENT APPLICATIONS

Permit or permit amendment applications adding new sources, or permit applications seeking increased authorized withdrawal volumes from new or existing sources will be evaluated using the Site Screening Process, which is described in more detail in the Department's Guidance in "Site Screening Process for Siting a New or Expanded Source of Public Water" available at www.state.ma.us/dep/brp/wtrm/sitescr.htm. The Site Screening Process, a method that uses a desktop screening tool to evaluate the likelihood of impact of a withdrawal on nearby streams, will also be applied to evaluation of the withdrawal impacts from increasing capacity from existing wells and the withdrawal impacts associated with system-wide increases from existing sources without change in source capacity. Where significant flow impact is indicated, the Department will more rigorously review the permit or permit amendment application, including more detailed instrumentation for pump test design, needs assessment, alternatives analysis, and implementation of offsets. (See the Department's Guidance on this Policy for more details on implementation.)

COMPENSATING FOR NEW OR INCREASED WITHDRAWALS

When new sources or increases in withdrawal volumes are proposed, the Department will evaluate whether additional conditions and offsets are necessary to achieve the appropriate balance between competing water uses. These conditions are likely to include operational restrictions, submission of management plans describing how the system will manage its sources to protect system integrity during periods of operational restrictions, and offsets for any new or increased withdrawals. Where new or increased withdrawals will have significant impacts that cannot be adequately mitigated, DEP will communicate to the applicant early in the process that approval is unlikely. (See the Department's Guidance on this Policy for more details on implementation.)

APPLICABILITY

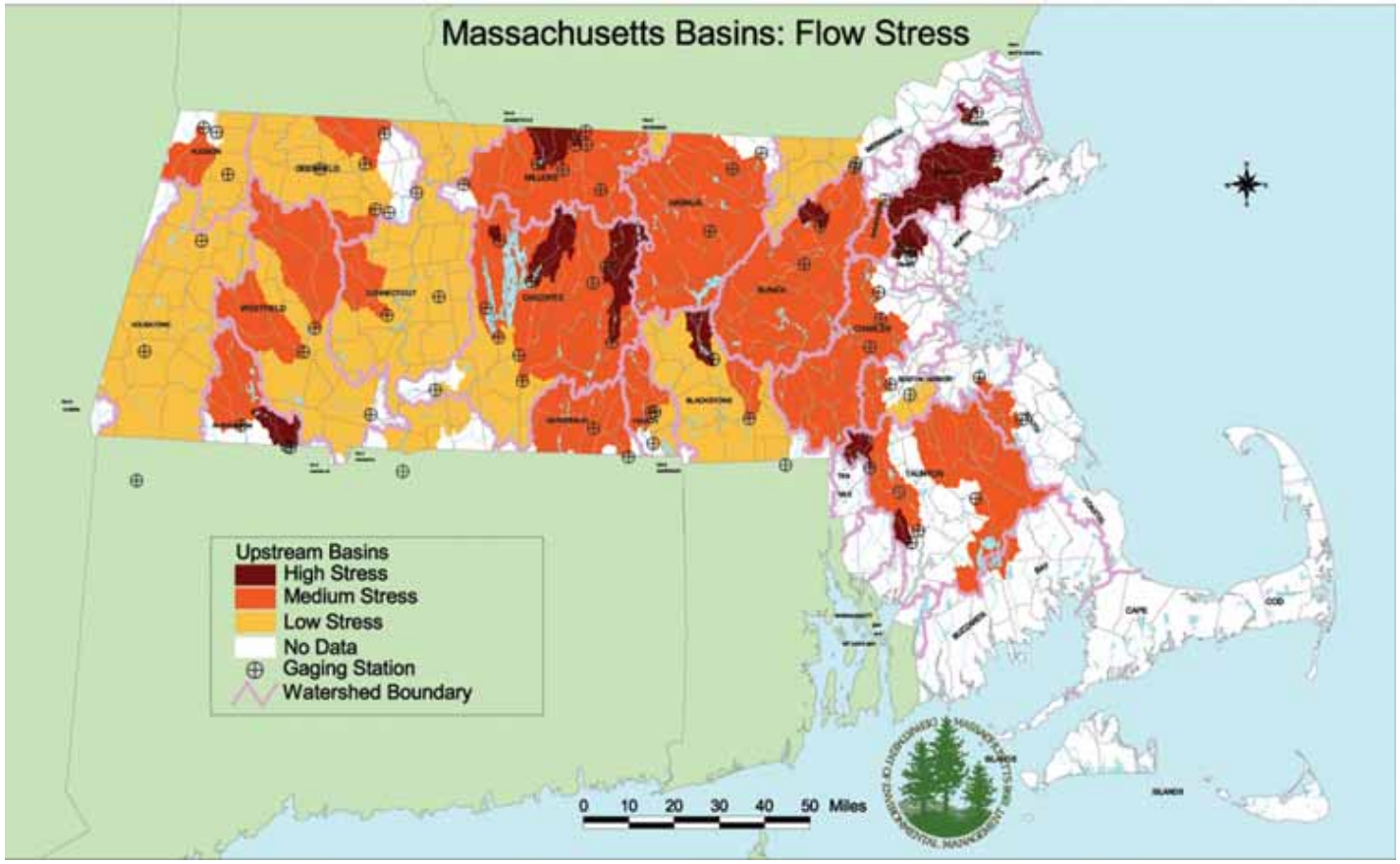
This Policy will be applied to all permitting decisions, including permits, permit amendments, and permit modifications resulting from the 5 Year Review of existing permits. Conditions that do not apply directly to permittees that are not public water supplies will be modified as appropriate to achieve the purposes of the policy in a manner

that is appropriate for the permittee. The Department reserves the right to use its discretion to vary from the standards and conditions outlined in this policy when there is a public health and safety issue, environmental emergency or as otherwise appropriate.

APPENDIX E

MAP OF STRESSED WATERSHEDS

STRESSED BASINS MAP - COMMONWEALTH OF MASSACHUSETTS



APPENDIX F

GROUNDWATER HYDRAULIC ANALYSES

FOR

NON POTABLE WATER

WATER MANAGEMENT ACT
PUMPING TEST DESIGN GUIDELINES
FOR NON POTABLE WELLS

During the pre-application phase of a project requiring a withdrawal permit, please schedule an appointment with Department staff to discuss your proposed pumping test which must include the following components at a minimum:

Water table or unconfined aquifer conditions:

1. A location map, showing the proposed well, all great ponds, streams, and wetlands within 1,000 foot radius of the well. Any other wells within ½ mile should be shown on the location map.

2. A conceptual model of the aquifer should be provided to aid in the proper determination of monitoring well locations. This should include a discussion of any sensitive receptors (ponds, streams, wetlands and other wells), their hydraulic connection to the withdrawal site, and a proposal for monitoring impacts.

3. A site map, showing the locations of all observation/monitoring wells (including the ambient well) and staff gauges. A minimum of four such observation points is required. They shall be located between the pumping well and any significant hydrogeologic boundaries such as no-flow boundaries, constant flux boundaries, or constant head boundaries. Well placement should be parallel and normal to groundwater flow to allow for the calculation of aquifer characteristics. The ambient well should be located outside the area of influence of the pumping well.

4. The planned pumping rate (recorded every two hours) and duration of the test must include the following. A five day antecedent period is required to allow for the determination of ambient water table trends and precipitation events. The pumping test must be conducted at the maximum rate for which approval is sought. The pumping test must be conducted for a minimum of five consecutive days (with no more than 2 hours total shutdown per day, stabilization period excluded) until stabilization. The well is considered stabilized when drawdown in the pumping well or 2-foot observation well has not varied more than 0.5 inches in a twenty-four hour period.

5. The observation well water level measurement frequency during drawdown and recovery shall be as follows. Initial measurement shall be at t = 0.5 minute after the start of the pumping test. Water levels will then be measured at consistent intervals to include 10 data points for every log cycle beginning with 1 minute, 10 minutes, and 100 minutes respectively, and twice daily

thereafter (frequency of measurements at least 8 hours apart) until the end of the test. Recovery readings should be taken at the same frequency as drawdown readings, beginning at t = 0.5 minute after shutdown. Recovery reading should be taken for as many days as the pumping well was pumped, or until 95% recovery has been obtained, whichever occurs first.

6. Location of the discharge line must be shown.

7. Precipitation measurement plan must be included.

Confined Aquifer Conditions:

1. Same as above.

2. Same as above.

3. Same as above except that one of the observation wells shall be located in the confining layer, one well in the unconfined layer, and two wells in the confined aquifer.

4. Same as above except that the pumping test duration must be extended to ten days if the water table does not stabilize (as defined above) within five days. If the test extends to ten days, the well shall be considered stabilized if, using a semi-log plot extrapolation of the time drawdown curve derived from the final days of the pumping test and projected over a 180 day period, 10% of the water column (or, minimally, 15 feet) remains above the intake of the pump if a submersible, or the top of the screen if a turbine. If the well does not stabilize within ten days, it must be continued until stabilization criteria are met.

5. Same as above.

6. Same as above.

7. Same as above.

Bedrock Wells:

1. Same as above.

2. Same as above.

3. No observation wells shall be required for pumping tests conducted in bedrock wells unless it is determined by the DEP Regional Office that observation wells are necessary to evaluate the longevity and integrity of the production well or the hydraulic connection to overlying surface water features. Also, private bedrock wells located within the zone of contribution of the proposed bedrock well should, if possible, be monitored for water level fluctuations during the pumping test.

   The proponent shall report whether any private bedrock wells could be influenced by the pumping test. If private wells will be affected, then these private wells, or a representative well, will be monitored during the pumping test. If this is not feasible, a bedrock observation well will be drilled in the vicinity of the private wells and will be monitored during the pumping test. The final observation well program will be at DEP's discretion.

4. The production well shall be pumped a minimum of 10 days at the rate for which approval is sought and which allows the well to stabilize. The production well shall be considered stabilized if, using a semi-log plot extrapolation of the time-drawdown curve derived from the final days of the pumping test (minimum 10 days) and projected over a 180-day period, 10% (or minimally 15 feet) of the water column remains above the intake of the pump if a submersible or the top of the screen if a turbine. The duration of the pumping test must extend until stabilization criteria are met.

5. Water levels in the production well shall be measured every 5 minutes for the first 2 hours and once every 6 hours thereafter.

6. Same as above.

7. Same as above. Note that precipitation events that result in water level fluctuations exceeding 2% of the total drawdown in the production well may require terminating the pumping test or extending the pumping test until drawdown meets the stabilization criteria.

PUMPING TEST REPORT

A description and discussion of the pumping test shall include the following information:

- ✓ Ambient water table fluctuation trends.
- ✓ Conceptual model of the aquifer, supported by stratigraphic data.
- ✓ Selection of pumping rate.
- ✓ Stabilization criteria and well performance.
- ✓ Drawdown and recovery data.
- ✓ Aquifer transmissivity, hydraulic conductivity, including graphs and calculations, determined from the pumping test.
- ✓ Precipitation and/or recharge events.
- ✓ Approvable yield.
- ✓ Any impacts to nearby public and private wells.
- ✓ Any impacts on surface water features.
- ✓ Any long-term monitoring, management or mitigation plan to minimize potential impacts.